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10/799,396	03/12/2004	Young-Joon Rhee	AB-1355 US	7324

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EXAMINER

CHIENT, LUCY P

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2871

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/799,396

Applicant(s)

RHEE ET AL.

Examiner

Lucy P. Chien

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-14 and 16-31 is/are pending in the application.
- 4a) Of the above claim(s) 8,9,11-14,21-28 and 31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,10,16-20,29 and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6/11/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Election/Restrictions***

Applicant's election with traverse of Species AI and Species BIII in the reply filed on 4/13/2007 is acknowledged. The traversal is on the ground(s) that "...there are no serious burden with Examiner examining claims in both groups...and claims have already been examined." This is not found persuasive because Examiner found different embodiments **Group A:** Species AI: The specifics being that there is a transparent color filter (230W) as shown in Figure 1. Species AII: The specifics being that there is no color filter (to the right of 230B) as shown in Figure 5. **Group B:** Species B1: The specifics being the arrangement of the color filters as shown in Figure 2. Species BII: The specifics being the arrangement of the color filters as shown in Figure 3. Species BIII: The specifics being the arrangement of the color filters as shown in Figure 4. Which would require searching in different areas. Also in Applicant's arguments send in 12/27/2006 on page 8 Applicant states that "a structure having a filter, colored, white or transparent is clearly different than a structure having no filter e.g., the latter structure does not require an additional filter formation, there is no space needed for additional filter, etc." Thus, these are different embodiments. Also Examiner is allowed to restrict even after examining all claims if different species are found.

Examiner will examine Claims 1,3-7,16-20,29-30 (pertains to Species AI) and Claim 10 (pertains to Species BIII). All other claims are withdrawn.

The requirement is still deemed proper and is therefore made FINAL.

Response to Arguments

Applicant's arguments with respect to claim 1,3-7,10,16-20,29-30 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

Claim 3,6 are objected to because of the following informalities: They depend on Claim 2, which has been cancelled. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1,4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al (US 6016178) in view of Morozumi (Re 33882)

Regarding Claim 1,4,

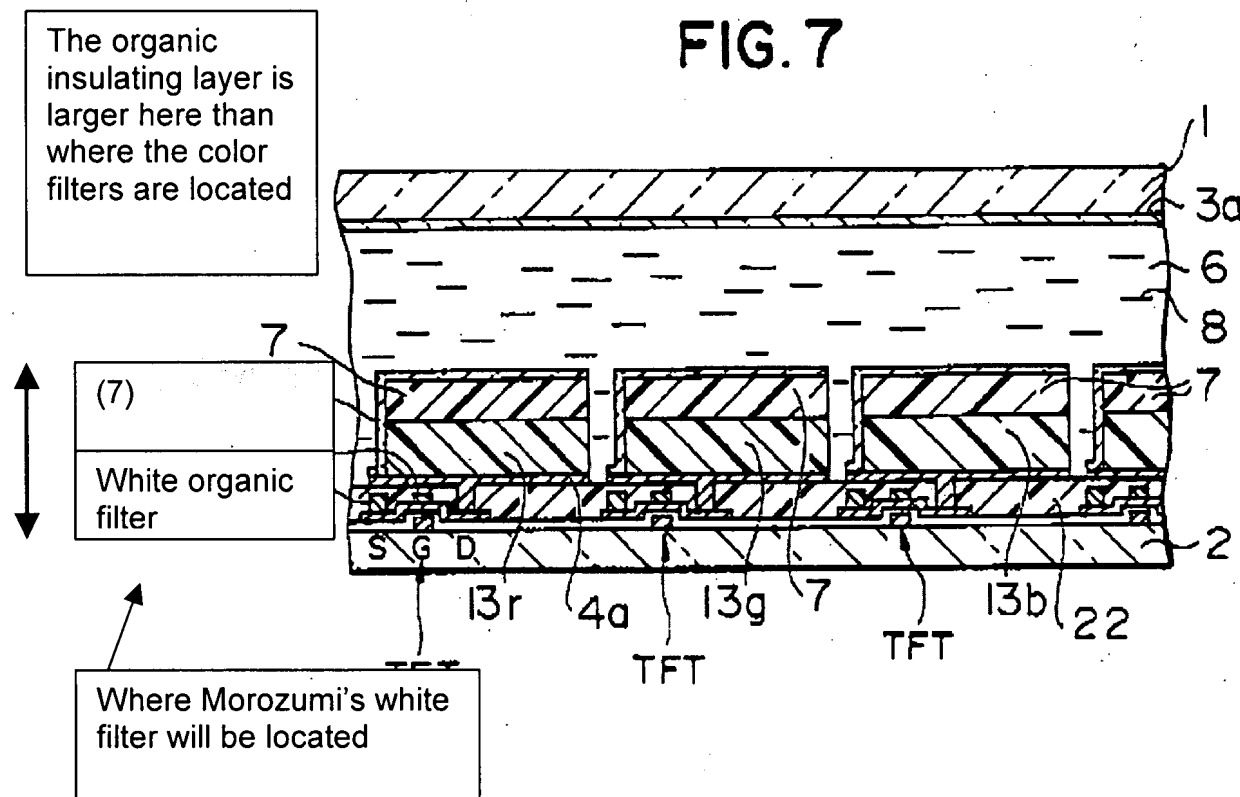
Kataoka et al teaches in Figure 17 an insulating substrate (2), a plurality of thin film transistors (TFT) formed on the substrate (2). A plurality of three primary color filters (13r,13g,13b) formed on the substrate (2). A plurality of first pixel electrodes (4b) formed on the color filters (13r,13g,13b) and connected to the thin film transistors (TFT) to complete a liquid crystal display with color filters.

Kataoka et al does not disclose the second pixel electrode on the substrate and an organic insulating layer including a plurality of first portions disposed between the

color filters and the first pixel electrodes and a plurality of second portions disposed under the second pixel electrodes and having thickness larger than the first portions.

Morozumi discloses (Fig. 16) (column 10, row 48-60) the use of a second pixel electrode (associated with a white filter or transparent filter) used to brighten the display. When adding Morozumi's white filter (which is an organic insulating layer also) to Kataoka et al's display (Fig. 7) it will be manufactured the same and thus the organic insulating layer (7) including a plurality of first portions disposed between the color filter (13r,13g,13b) and the first pixel electrode (4b) and a plurality of second portions (which is Morozumi's white organic insulating filter and the insulating layer (7) of Kataoka et al under the second pixel electrodes has a thickness larger than the first portions (7 shown above 13r,13g,13b)

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kataoka et al's color display device to include Morozumi's white filter and second pixel electrode to improve the overall brightness of the display (Column 10, Rows 54-60).



Claim 3,6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al (US 6016178) and of Morozumi (Re 33882) in view of Kadota et al (US 6031512).

Regarding Claim 3,6.

Kataoka et al and Morozumi discloses everything as disclosed above.

Kataoka et al and Morozumi does not disclose an inorganic insulating layer disposed between the color filters and the thin film transistors.

Kadota et al discloses (Figure 1) an inorganic insulating layer (5) disposed between the color filters (8,9,10) and the thin film transistors (TFT, 3) thereby providing the pixel electrode to electrically connect through the insulating layer to connect to the drain region (Column 1, rows 25-35).

Art Unit: 2871

It would have been obvious to one of ordinary skill in the art to modify Kataoka et al and Morozumi to include Kadota et al's inorganic insulating layer motivated by the desire to provide the pixel electrode to electrically connect through the insulating layer to connect to the drain region (Column 1, rows 25-35).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al (US 6016178) and of Morozumi (Re 33882) in view of Kawase (US 6787275).

Kataoka et al and Morozumi discloses everything as disclosed above.

Kataoka et al and Morozumi do not disclose the transparent filter being made of a transparent photosensitive material or acrylic material.

Kawase discloses (Column 23, Row 18-25) the transparent filter made of a transparent photosensitive material for excellent light transmittance.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kataoka et al and Morozumi to include Kawase's transparent photosensitive material to display excellent transmittance of visible light. (Column 23, Row 18-25).

Claim 7,10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al (US 6016178) and of Morozumi (Re 33882) in view of Sunohara et al (US 5587819).

Regarding Claim 7.

Kataoka et al and Morozumi discloses everything as disclosed above.

Kataoka et al and Morozumi do not disclose the first pixel electrode including third, fourth, and fifth pixel electrodes located under the red, green, and blue color filters.

Sunohara et al discloses in Fig. 28 the three major colors being red, blue, and green. The three colors located on top and three pixel electrodes located under it and the pixel electrodes are also arranged in a direction so the display can produce high-luminance colors (in Abstract).

It would have been obvious to one of ordinary skilled in the art to modify Kataoka et al and Morozumi to include Sunohara et al's first pixel electrode including third, fourth, and fifth pixel electrodes located under the red, green, and blue color filters to display a high-luminance color display (abstract).

Regarding Claim 10.

Kataoka et al and Morozumi do not disclose a 2x2 matrix having the pixel electrodes arranged in sequence as claimed.

Sunohara discloses in Figure 3, a 2x2 matrix having the first row including third (first pixel) and fourth pixel electrodes (third pixel) arranged in sequence and a second row including fifth (fifth pixel) and second pixel electrodes (second pixel) arranged in sequence to provide high luminance colors.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al and Morozumi to include Sunohara et al's primary colors in the arranged order to provide high luminance colors (Column 34, Rows 41-55).

Art Unit: 2871

Claim 16,20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) in view of Suzuki et al (US 6081309).

Regarding Claim 16.

Kadota et al discloses in Figure 1 a first substrate (20). A plurality of gate lines (3) formed on the first substrate (20). A gate insulating layer (4) formed on the gate lines (3); a semiconductor layer (2) formed on the gate insulating layer (4); a plurality of data lines (not shown, known existence) formed on the gate insulating layer (4) and intersecting the gate lines (3) to define a plurality of pixel areas; a first protective layer (5) formed on the data lines (not shown, known existence); a plurality of red (8), green (9), blue (10) color filters formed on the first protective layer (5). A second protective layer (11) formed on the color filters (8,9,10). A plurality of pixel electrodes (1) formed on the second protective layer (11) and electrically connected (CON) to the gate lines (3) and data lines through the semiconductor layer (2). A second substrate (12) facing the first substrate (20). A common electrode (13) formed on the first substrate and a liquid crystal layer (shown between 13 and 1) interposed between the first substrate (20) and second substrate (20).

Kadota et al does not disclose an Ohmic contact layer nor does Kadota et al disclose the liquid crystal layer interposed between the first substrate and second substrate wherein the pixel areas include a plurality of transparent color filters and wherein the pixel electrodes formed on the blue filter or transparent filter has a smaller area than the pixel electrodes formed on the red or green filters.

Park et al (Page 5 Row [0097]) teaches the use of an Ohmic contact layer used to reduce contact resistance to provide better contact between semiconductors.

Morozumi discloses (column 10, row 48-60) that the use of transparent filters are used so that the overall brightness of the display can be improved.

Suzuki et al discloses (Fig. 4) wherein the pixel electrodes formed on the blue filter has a smaller area than the pixel electrodes formed on the red or green filters thus preventing a disturbance of color balance while retaining a high resolution and excellent color image qualities (abstract).

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al's color display device to include Morozumi's transparent filter and also to include Park et al's ohmic contact layer to provide excellent contact between semiconductors and to display excellent transmittance of visible light with white filters to include Suzuki et al's pixel electrodes formed on the blue filter has a smaller area than the pixel electrodes formed on the red or green filters thus preventing a disturbance of color balance while retaining a high resolution and excellent color image qualities (abstract).

Regarding Claim 20,

In addition to Kadota et al, Morozumi, Park et al, and Suzuki et al as described above Kadota et al teaches (Column 4, Row 30-37) a black mask used as a light shielding layer.

Art Unit: 2871

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) and of Suzuki et al (US 6081309) in view of Yamada (US 6798471).

Kadota et al, Morozumi Park et al, and Suzuki do not disclose the use of a vertical aligned liquid crystal.

Yamada discloses (Column 1, Rows 19-26) that the use of a vertically aligned liquid crystal provides higher contrast, higher response speed, and excellent viewing angle characteristics.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al, Morozumi's, Park et al, and Suzuki to include Yamada's vertically aligned liquid crystal to provide excellent viewing angles for the display.

Claim 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) and of Suzuki et al (US 6081309) and of Yamada (US 6798471) in view of Kim et al (US 20020145695).

Kadota et al, Morozumi, Park et al, Suzuki et al and Yamada do not disclose the use of protrusions formed on the common electrode and made of organic material, wherein the pixel electrodes have cutouts.

Kim et al discloses in FIG. 1E (page 3, [0044]) the common electrode 400, and the protrusion 412 is formed on the common electrode 400. The protrusion 412 is

made of organic material used to form contacts between semiconductors. Fig. 3a shows arrangements of the same invention of the pixel electrode (90) cutouts corresponding to the common electrode (400). Which stabilize the electric field (Page 4, [0062]).

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al, Morozumi, Park et al, Suzuki and Yamada to include Kim et al's protrusions for better stabilization of the electric field (Page 4, [0062]).

Claim 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al (US 6031512) and of Morozumi (Re 33882) and of Park et al (US20020074549) and of Suzuki et al (US 6081309) in view of Kawase (US 6787275).

Kadota et al, Morozumi, Park et al, and Suzuki et al do not disclose the liquid crystal layer having a twisted alignment.

Kawase discloses in Figure 40 (Column 26, Rows 54-60) having a twisted nematic liquid crystal serves as a transmission of light liquid crystal.

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kadota et al, Morozumi, Park et al, and Suzuki et al to include Kawase's twisted nematic liquid crystal to control the transmission of light. (Column 26, Rows 54-60)

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al (US 6016178) and of Morozumi (Re 33882) in view of Suzuki et al (US 6081309).

Kataoka et al and Morozumi discloses everything as disclosed above.

Kataoka et al and Morozumi does not disclose one of the first pixel electrodes formed on the blue one of the primary color filters has a smaller area than either of two of the first pixel electrodes formed on a red one or a green one of o the primary color filters.

Suzuki et al discloses (Fig. 4) wherein the pixel electrodes formed on the blue filter has a smaller area than the pixel electrodes formed on the red or green filters thus preventing a disturbance of color balance while retaining a high resolution and excellent color image qualities (abstract).

It would have been obvious to one of ordinary skill in the art, at the time of the invention to modify Kataoka et al and Morozumi's to include Suzuki et al's pixel electrodes formed on the blue filter has a smaller area than the pixel electrodes formed on the red or green filters thus preventing a disturbance of color balance while retaining a high resolution and excellent color image qualities (abstract).

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka et al (US 6016178) and of Morozumi (Re 33882) in view of Abukawa et al (US 5642176).

Kataoka et al and Morozumi discloses everything as disclosed above.

Kataoka et al and Morozumi does not disclose the second pixel electrodes formed over a transparent filter and wherein the second pixel electrodes have a smaller area than either of two of the first pixel electrodes formed on the red or green one of the primary color filters.

Abukawa et al discloses (Fig. 3c) the second pixel electrodes formed over a transparent filter (11w) and wherein the second pixel electrodes have a smaller area than either of two of the first pixel electrodes formed on the red or green (2R,2G) one of the primary color filters to enhance the quality of a color display.

It would have been obvious to one of ordinary skill in the art to modify Kataoka et al and Morozumi to include Abukawa et al's the second pixel electrodes formed over a transparent filter (11w) and wherein the second pixel electrodes have a smaller area than either of two of the first pixel electrodes formed on the red or green (2R,2G) one of the primary color filters to enhance the quality of a color display (Column 2, rows 1-30).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucy P. Chien whose telephone number is 571-272-8579. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571)272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2871

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Lucy P Chien
Examiner
Art Unit 2871


ANDREW SCHECHTER
PRIMARY EXAMINER